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09/909,910	07/23/2001	Yoshio Sano	Q65531	9164

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SUGHRUE, MION, ZINN, MACPEAK & SEAS
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EXAMINER	
DONG, DALEI	

ART UNIT	PAPER NUMBER
2875	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/909,910	SANO ET AL.	
	Examiner	Art Unit	
	Dalei Dong	2875	

-- The MAILING DATE of this communication appears on th cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 February 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-52* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-52* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *23 July 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☒ Certified copies of the priority documents have been received in Application No. *09/909,910* .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-5, 16, 21-23, 26-28 and 31-52 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,008,582 to Asano in view of U.S. Patent No. 5,640,068 to Amemiya.

Regarding to claims 1-5, and 43-52, Asano discloses in Figures 1-4, "An ac PDP (plasma display panel) in a first embodiment according to the present invention will be described with reference to FIGS. 1 to 3. Referring to FIG. 1 showing the ac PDP in an exploded perspective view, a back plate 3 made of glass and a front plate 10 made of glass are disposed in parallel and opposite to each other. The back plate 3 and the front plate 10 are spaced a predetermined distance apart from each other by a plurality of parallel partition walls formed on the inner surface of the back plate 3. Only partition walls (barrier ribs) 1a, 1b, 1c and 1d among all the plurality of parallel partition walls are shown in the drawings. The partition walls 1a, 1b, 1c and 1d define discharge spaces 2 between the plates 3 and 10. Parallel composite electrodes each consisting of a transparent electrode 4 and a metal bus electrode 5 are formed on the inner surface of the front plate 10, and a dielectric glass layer 6 and a protective layer 7 of MgO are formed in

that order on the inner surface of the front plate 10 so as to cover the composite electrodes" (column 4, line 8-25)

Asano also discloses in Figures 1-4, "parallel address electrodes 8 are formed between the partition walls 1a, 1b, 1c and 1d on the inner surface of the back plate 3 perpendicularly to the composite electrodes 4, 5. Phosphor layers 9 respectively containing phosphor materials are formed on the side surfaces of the partition walls 1a, 1b, 1c and 1d, and portions of the inner surface of the back plate 3 defining the bottoms of the discharge spaces 2. The ac PDP is of a surface discharge type in which an ac voltage is applied to the composite electrodes each consisting of the transparent electrode 4 and the bus electrode 5 to produce a discharge by an electric field created in the discharge spaces 2. The direction of the electric field changes at a frequency corresponding to that of the ac voltage. The phosphor layers 9 are energized by UV rays produced by discharge to emit light, which is visible through the front plate 10" (column 4, line 26-40).

Asano further discloses in Figures 1-4, "the PDP has a back plate 3 provided with a plurality of parallel partition walls, and auxiliary partition walls extended perpendicularly to the partition walls between the adjacent partition walls. In FIG. 4, only the partition walls (barrier ribs) 1a, 1b and 1c among the plurality of partition walls, and only the partition walls 52a, 52b, 52c and 52d among the auxiliary partition walls are shown. Address electrodes 8 (FIG. 1) are extended in parallel to the partition walls 1a, 1b and 1c on portions of the inner surface of the back plate 3 defining bottoms of discharge spaces 2 formed between the adjacent partition walls 1a and 1b and between

the adjacent partition walls 1b and 1c. Although the partition walls 1a, 1b and 1c shown in FIG. 4, 5 have a trapezoidal cross section, the partition walls 1a, 1b and 1c may have a cross section of any suitable shape, such as a rectangular shape or a shape defined by curves. Bus lines 5 (FIG. 1) are formed in parallel to the auxiliary partition walls 52a, 52b, 52c and 52d. The auxiliary partition walls 52a, 52b, 52c and 52d have a substantially trapezoidal or rectangular cross section. In a modification of the PDP of FIG. 4 shown in FIG. 5, auxiliary partition walls 54a, 54b, 54c and 54d have each opposite curved side surfaces 55 diverging toward the inner surface of the back plate 3" (column 9, line 1-22).

However, Asano does not disclose the display electrode portion has a notched portion or a cut-away portion between pixel cells adjacent each other in the row direction. Amemiya teaches in Figures 1 and 2, "the surface substrate 14 and the back substrate 12 having formed with the column electrodes and the row electrodes then are sealed together. The air in the discharge region 18 is exhausted, and the water on the surface of the MgO layer is vapored away by baking the whole of the sealed substrate. Inertia composite gas including xenon (Xe) gas at 1-10%, for example, as a rare gas are introduced and sealed into the discharge region 18 in the manner that the pressure of the inertia gas is 200-600 torr" (column 3, line 50-59).

Amemiya also teaches in Figures 1 and 2, "a plan of the column electrodes Xi and Yi. Referring to FIG. 2, one of the column electrodes Xi consists of a base portion 30 extending horizontally in each of the emitting pixel regions, and a projecting portion extending cross the longitudinal direction of the base portion 30 toward the other column

electrode Yi. The other of the column electrodes Yi similarly consists of a base portion extending horizontally in each of the emitting pixel regions, and a projecting portion extending cross the longitudinal direction of the base portion toward the other electrode Xi. Accordingly, both of the projecting portions 32, 32 of the column electrodes Xi and Yi are opposite to each other through a predetermined gas ge. The projecting portion 32 preferably extends perpendicularly to the longitudinal direction of the base portion 30" (column 4, line 8-21).

Amemiya further discloses in Figures 1 and 2, "the size of the ach of the protion in the column electrodes Xi and Yi are indicated below. The longitudinal length of the base portion 30 per one discharge region (the distance between lines A-A and B-B in FIG. 2) corresponds to the inteval between the adjacent barrier ribs, and equals to 380 μm. As seen in FIG. 2, the table 1 indicates the length of the projecting portion 32 i.e. the sum of the width of the base portion 30 and the longitudinal length of the projecting portion 32 1e, and the width w1 of the top of the projecting portion" (column 4, line 22-31).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilize the column Xi and Yi electrode of Amemiya for the ac plasma display panel device of Asano in order to provide a high emitting efficiency and being able to emit a bring light and further to perform a discharge emitting diplay with a relatively small consumption of power.

3. Claims 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,008,582 to Asano in view of U.S. Patent No. 5,640,068 to Amemiya in view of U.S. Patent No. 5,557,168 to Nakajima.

Regarding to claims 6-8, Asano discloses an AC discharge plasma display panel comprising a front substrate a rear substrate, column ribs and row ribs operable to define pixel cells in a column direction and in a row direction, respectively, and discharge electrodes having a display electrode portion and a bus electrode portion.

However, Asano fails to disclose the display electrode portion has a notched portion or a cut-away portion between pixel cells adjacent to each other in the row direction and a projecting portion. Amemiya teaches the display electrode portion has a notched portion or a cut-away portion between pixel cells adjacent to each other in the row direction.

However, Amemiya fails to teach a projection portion on top of the barrier walls. Nakajima teaches in Figure 3, "a spacer 28 of an insulating material like a glass is attached to the crossing of first second separating walls 26a and 26b" (column 4, line 44-46).

Nakajima also teaches the "spacer 28 is between front barrier rib 26 and cathode support layer 22, a space 35 having the same height as spacer 28 is formed between first cylindrical cathode 20 and spacer 28. In discharge, ions can move between discharge cells 30 through space 35" (column 5, line 18-22).

Nakajima further teaches in Figure 1, "cathode lead pattern 18 of rear substrate 12 and transparent anode 24 of front substrate 14 cross each other a predetermined distance

apart, and each of first cylindrical cathode 20 is located corresponding discharge cell 30. Spacer 28 attached to front barrier rib 26 is in contact with the surface of cathode support layer 22. End 20b of first cylindrical cathode 20 faces belt-shaped transparent anode 24 a predetermined distance apart" (column 4, line 47-54).

It would have been obvious to one of ordinary skills in the art at the time the invention was made to utilize the column electrodes Xi and Yi of Amemiya and the spacer of Nakajima between the lattice-shaped ribs for the AC plasma discharge display panel device of Asano in to provide a high emitting efficiency and being able to emit a bring light and further to perform a discharge emitting diplay with a relatively small consumption of power.

4. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,008,582 to Asano in view of U.S. Patent No. 5,640,068 to Amemiya in view of U.S. Patent No. 5,557,168 to Nakajima and yet in further view of U.S. Patent No. 5,889,365, to Tanabe.

Regarding to claims 9 and 10, Asano discloses an AC discharge plasma display panel comprising a front substrate a rear substrate, column ribs and row ribs operable to define pixel cells in a column direction and in a row direction, respectively, and discharge electrodes having a display electrode portion and a bus electrode portion.

However, Asano fails to disclose the display electrode portion has a notched portion or a cut-away portion between pixel cells adjacent to each other in the row direction and a projecting portion and further a recessive portion. Amemiya teaches the

display electrode portion has a notched portion or a cut-away portion between pixel cells adjacent to each other in the row direction.

However, Amemiya fails to teach a projecting and a recessive portion. Nakajima teaches projecting portion; however fails to teach a recessive portion. Tanabe teaches in Figure 2A and 2B a plasma display panel comprising "barrier ribs 27 are formed in the shape of a grid between the front plate 21 and the rear plate 22 to form a plurality of discharge cells 26." (column 3, line 48-50). Tanabe also teaches "the barrier ribs 27 are formed on an insulating layer 30 formed on the rear plate 22, fluorescent coating 31 of fluorescent materials are formed on inner surfaces of the barrier ribs 27, and the priming slits 32 are formed in the upper ends of the barrier ribs 27" (column 4, line 22-26). The priming slits or recessive portion of Tanabe are formed at the intersections of the lattice-shaped ribs; further the priming slits of Tanabe "define" the electrodes between pixel cells.

It would have been obvious to one of ordinary skills in the art at the time the invention was made to utilize the column electrodes Xi and Yi of Amemiya and the spacer of Nakajima between the lattice-shaped ribs and recessive portion of Tanabe for the AC plasma discharge display panel device of Asano in order to provide a high emitting efficiency and being able to emit a bring light and further to perform a discharge emitting display with a relatively small consumption of power.

5. Claims 11-15 and 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,008,582 to Asano in view of U.S. Patent No. 5,640,068 to Amemiya in

view of U.S. Patent No. 5,557,168 to Nakajima and yet in further view of U.S. Patent No. 5,939,828 to Matsuzaki.

Regarding to claims 11-15 and 17-19, Asano discloses an AC discharge plasma display panel comprising a front substrate a rear substrate, column ribs and row ribs operable to define pixel cells in a column direction and in a row direction, respectively, and discharge electrodes having a display electrode portion and a bus electrode portion.

However, Asano fails to disclose the display electrode portion has a notched portion or a cut-away portion between pixel cells adjacent to each other in the row direction and a projecting portion and further a horizontal barrier wall formed of a material having a dielectric constant lower than the insulating layer and the horizontal barrier wall comprising an extended portion. Amemiya teaches the display electrode portion has a notched portion or a cut-away portion between pixel cells adjacent to each other in the row direction.

However, Amemiya fails to teach a projecting and a horizontal barrier wall formed of a material having a dielectric constant lower than the insulating layer and the horizontal barrier wall comprising an extended portion. Nakajima teaches projecting portion; however fails to teach a horizontal barrier wall formed of a material having a dielectric constant lower than the insulating layer and the horizontal barrier wall comprising an extended portion.

. Matsuzaki teaches in Figures 10(a) to 10 (c) a barrier wall 110 and also according to the Matsuzaki "the voltage applied to the address electrodes 10 for generating the address discharge and the voltage applied to the display electrodes 6 (or

bus electrodes) is lowered, the height of the barrier rib 110 is not increased. For example, the height of the barrier ribs is from 0.15 to 0.02 mm in the standard gas discharge type display device, whereas the height is from 0.05 to 0.1 mm in this embodiment, which is less than ½ of that of the standard device" (column 19, line 16-24).

Matsuzaki also teaches "the barrier ribs 110 forming the discharge space on the side of the front substrate are formed by the partition wall substrate 90 comprising a metal plate having openings and covered with the insulation film" (column 10, line 39-44). The metal plate that forms the barrier wall has a lower dielectric constant than the insulating layer. As shown in the different embodiments of Matsuzaki the barrier wall is placed on one of the sustain electrode or the scan electrodes and the barrier wall have different widths for the two types of electrodes.

Matsuzaki further teaches in Figure 17(a), 17(b) and Figure 18(a) "a branched portion is disposed on one side of the address electrodes 10 which protrudes toward the main discharging space 100 at locations where the display electrodes 62, acting as a common electrode in the main discharge for display, and the address electrodes 10 intersect. In this case, since the address electrodes 10 are formed on the barrier ribs 11, the barrier ribs also protrude in the discharging space 200. A portion showing the feature of this embodiment is depicted by 340 in Figure 18(a)" (column 27 line 65-67 to column 28 line 1-8).

It would have been obvious to one of ordinary skills in the art at the time the invention was made to utilize the column electrodes Xi and Yi of Amemiya and the spacer of Nakajima between the lattice-shaped ribs and horizontal barrier wall of

Matsuzaki for the AC plasma discharge display panel device of Asano in order to provide a high emitting efficiency and being able to emit a bring light and further to perform a discharge emitting display with a relatively small consumption of power.

6. Claims 20, 25 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,008,582 to Asano in view of U.S. Patent No. 5,640,068 to Amemiya in view of U.S. Patent No. 5,557,168 to Nakajima and yet in further view of U.S. Patent No. 6,037,713 to Fukuta.

Regarding to claims 20, 25 and 30, Asano discloses an AC discharge plasma display panel comprising a front substrate a rear substrate, column ribs and row ribs operable to define pixel cells in a column direction and in a row direction, respectively, and discharge electrodes having a display electrode portion and a bus electrode portion.

However, Asano fails to disclose the display electrode portion has a notched portion or a cut-away portion between pixel cells adjacent to each other in the row direction and a projecting portion and further thickness of the electrode. Amemiya teaches the display electrode portion has a notched portion or a cut-away portion between pixel cells adjacent to each other in the row direction.

However, Amemiya fails to teach a projecting and thickness of the electrode. Nakajima teaches projecting portion; however fails to teach thickness of the electrode. Fukuta teaches "the thickness of the aluminum electrodes is typically 5,000 Å to 40,000 Å for the bus electrodes in the PDP, 5,000 Å to 20,000 Å for the address electrodes in the PDP, and 500 Å 3,000 Å for the gate electrodes of the TFTs in the active matrix liquid

crystal display device and for the scanning electrodes and the signal electrodes in the simple matrix liquid crystal display device" (column 5, line 5-11). It is also old and well known in the art that the thickness of the electrode can be adjusted in accordance with the resistance desired for the electrodes.

It would have been obvious to one of ordinary skills in the art at the time the invention was made to have composed the column electrodes Xi and Yi of Amemiya with the electrode thickness of Fukuta and the spacer of Nakajima between the lattice-shaped ribs for the AC plasma discharge display panel device of Asano in order to provide a high emitting efficiency and being able to emit a bring light and further to perform a discharge emitting display with a relatively small consumption of power.

7. Claims 24 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,008,582 to Asano in view of U.S. Patent No. 5,640,068 to Amemiya in view of U.S. Patent No. 5,900,694 to Matsuzaki.

Regarding to claims 24 and 29, Asano discloses an AC discharge plasma display panel comprising a front substrate a rear substrate, column ribs and row ribs operable to define pixel cells in a column direction and in a row direction, respectively, and discharge electrodes having a display electrode portion and a bus electrode portion.

However, Asano fails to disclose the display electrode portion has a notched portion or a cut-away portion between pixel cells adjacent to each other in the row direction and the resistance of the common bus electrode is 1/3 to 1/12 of the scan-side

bus electrode. Amemiya teaches the display electrode portion has a notched portion or a cut-away portion between pixel cells adjacent to each other in the row direction.

However, Amemiya fails to teach the resistance of the common bus electrode is 1/3 to 1/12 of the scan-side bus electrode. Matsuzaki teaches in Figure 25a, "the bus electrode 62 and 72 have branchlike members 18b, so that the resistance thereof is lower than that of the bus electrodes of the conventional display panel having no branchlike member" (column 3, line 49-52). Matsuzaki also teaches in Figure 6a to 6c, the bus electrode 192 of the central main discharge electrode 19 among the three main discharge electrodes 6 and 19 has branchlike member 18b on both sides, and the bus electrodes 62 of the other main discharge electrodes 6 are arranged so that the sides thereof on which the branchlike members 18b are provided face the central main discharge electrode 7" (column 9, line 1-8). The bus electrodes of Matsuzaki have a resistance difference of 1/3 to 1/12 proportionally.

It would have been obvious to one of ordinary skills in the art at the time the invention was made to have composed the column electrodes Xi and Yi of Amemiya with the resistance characteristic of Matsuzaki for the AC plasma discharge display panel device of Asano in order to provide a high emitting efficiency and being able to emit a bring light and further to perform a discharge emitting display with a relatively small consumption of power.

Response to Arguments

8. Applicant's arguments with respect to claims 1-52 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following cited patents are cited to further show the state of the art with respect to the plasma display panel.

U.S. Patent No. 6,051,928 to Choi.

U.S. Patent No. 6,469,451 to Mori.

U.S. Patent No. 6,479,935 to Park.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dalei Dong whose telephone number is (703)308-2870. The examiner can normally be reached on 8 A.M. to 5 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sandra O'Shea can be reached on (703)305-4939. The fax phone numbers for the organization where this application or proceeding is assigned are (703)872-9318 for regular communications and (703)872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

D.D.
February 24, 2003

Sandra O'Shea
Supervisory Patent Examiner
Technology Center 2800